Bioscience Development in New Mexico

Tobacco Settlement Revenue Oversight Committee
2 November 2015

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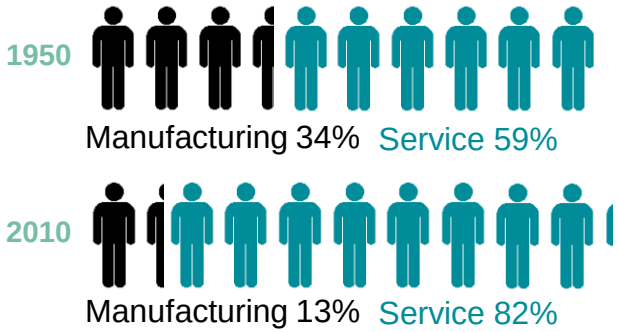
UNM HEALTH SCIENCES CENTER

Economic Challenges
Currently Facing the US Economy

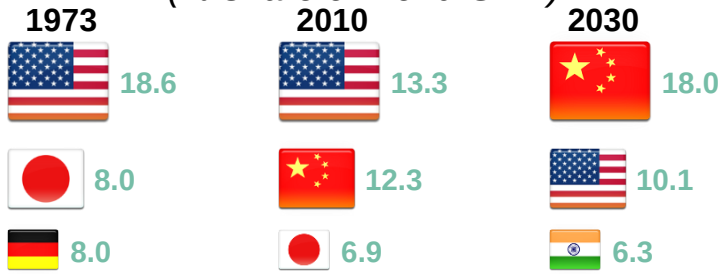
DECREASED MANUFACTURING

Percentage of Non-Farm Workers Employed by Industry



INCREASED GLOBAL COMPETITION

Top 3 Countries by Economic Dominance
(% share of world GDP)



INSECURITY OF JOB GROWTH

Months Required to Recover Job Growth to Pre-Recession Rates

INSECURITY OF HEALTH CARE & SOCIAL SUPPORT SYSTEMS

Healthcare Costs increased nearly 1.5 times faster than wages between 1999 and 2011

Almost 60% of personal bankruptcies are linked to medical bills

41% of American adults had trouble finding necessary care due to costs in 2011

Sources: healthcare.gov, Center for Studying Health System Change, CIA World Fact Book, US Department of Commerce

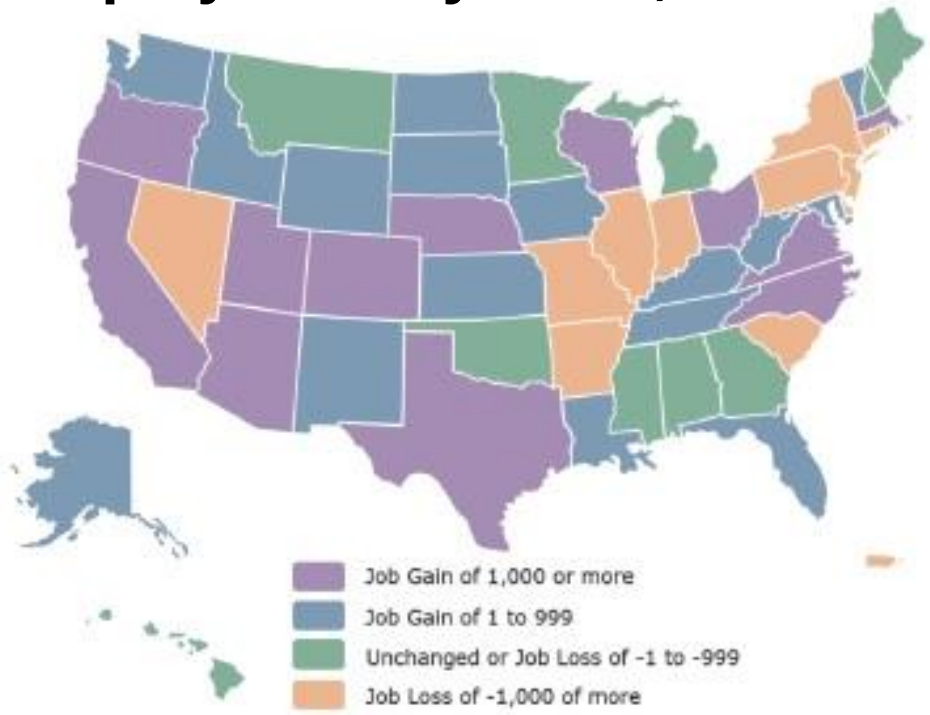
Industrial Age

- Countries that have become richest invest 1.5 – 3.8% of GDP in technology and research development

- Public-private partnership has been key driver

Robust Promise of Bioscience

Change in Bioscience Employment by State, 2007 – 12



- Nearly 111,000 new, high-paying jobs have been added over the last decade
- Bioscience has expanded significantly, with 17% growth since 2007
- The industry continues to create high-wage, family-sustaining jobs with average wages 80% greater than the overall private sector and growing at a faster rate

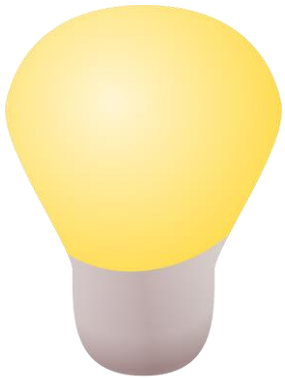
Source: Batelle/BIO (2014) "Batelle/BIO State Biosciences Jobs, Investment and Innovation 2014." https://www.bio.org/sites/default/files/Battelle-BIO-2014-Industry.pdf

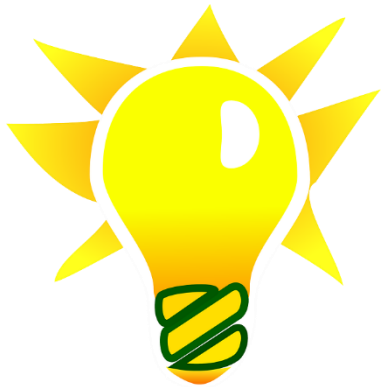
Economic Model

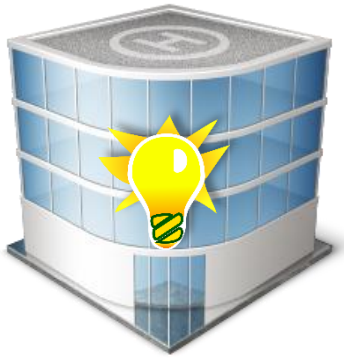
Premises:

1. Scientific progress is key to turning the “wheels”
2. Goal of technology policy is improving quality of life
3. Governmental intervention necessary to prevent underinvestment in R&D

Economic Model







Inventions

Innovations

Technology-Based Companies

Broader Economic Development

Public Sector

Private Sector

"Valley of Death"

Economic Model

- Innovation leads technology
- Technology is driver of economic growth

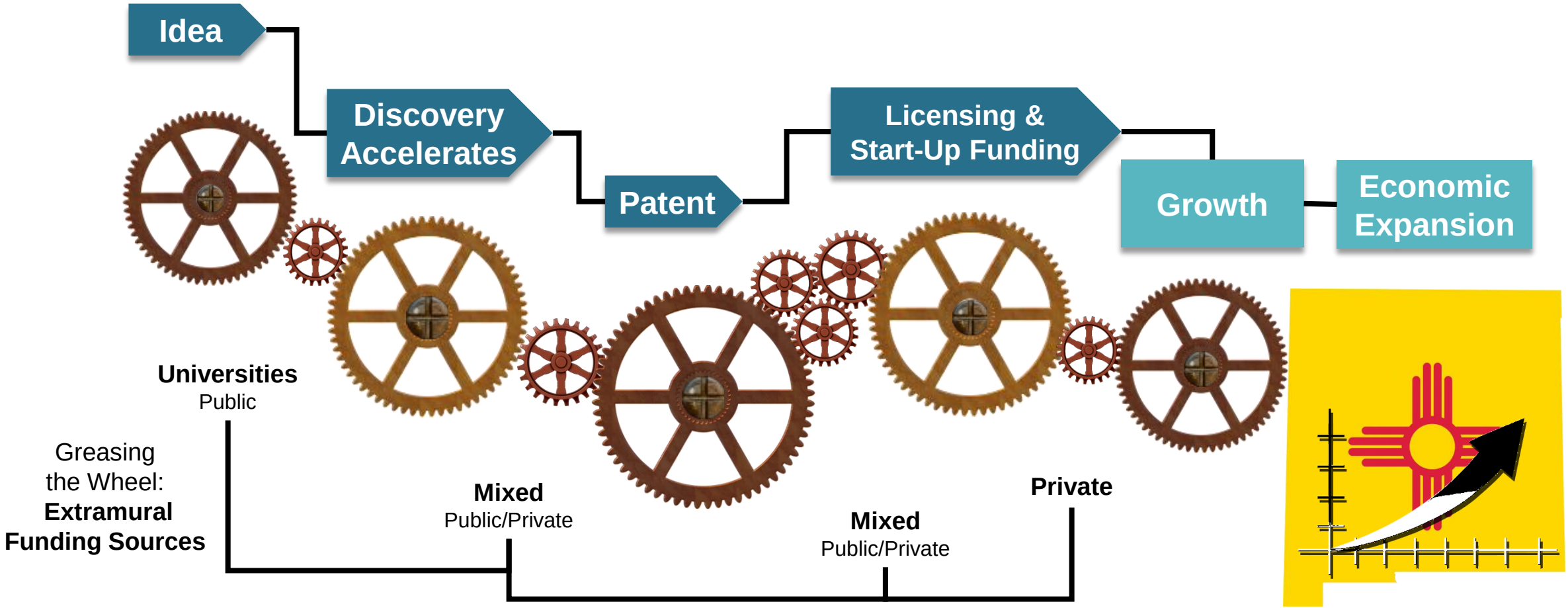
- University is key “public” driver
- Private start-up companies key to advancing technology to commercial purpose

Effective Public-Private Partnership is Key

- University/Public Sector
  - Their view: Contributes scientists and experts
  - Business perspective: Minimizes technical risk, market risk, and evolving nature of market
- Private Sector
  - Their view: Priority of economic growth and jobs
  - Academic perspective: Societal impact

The Process

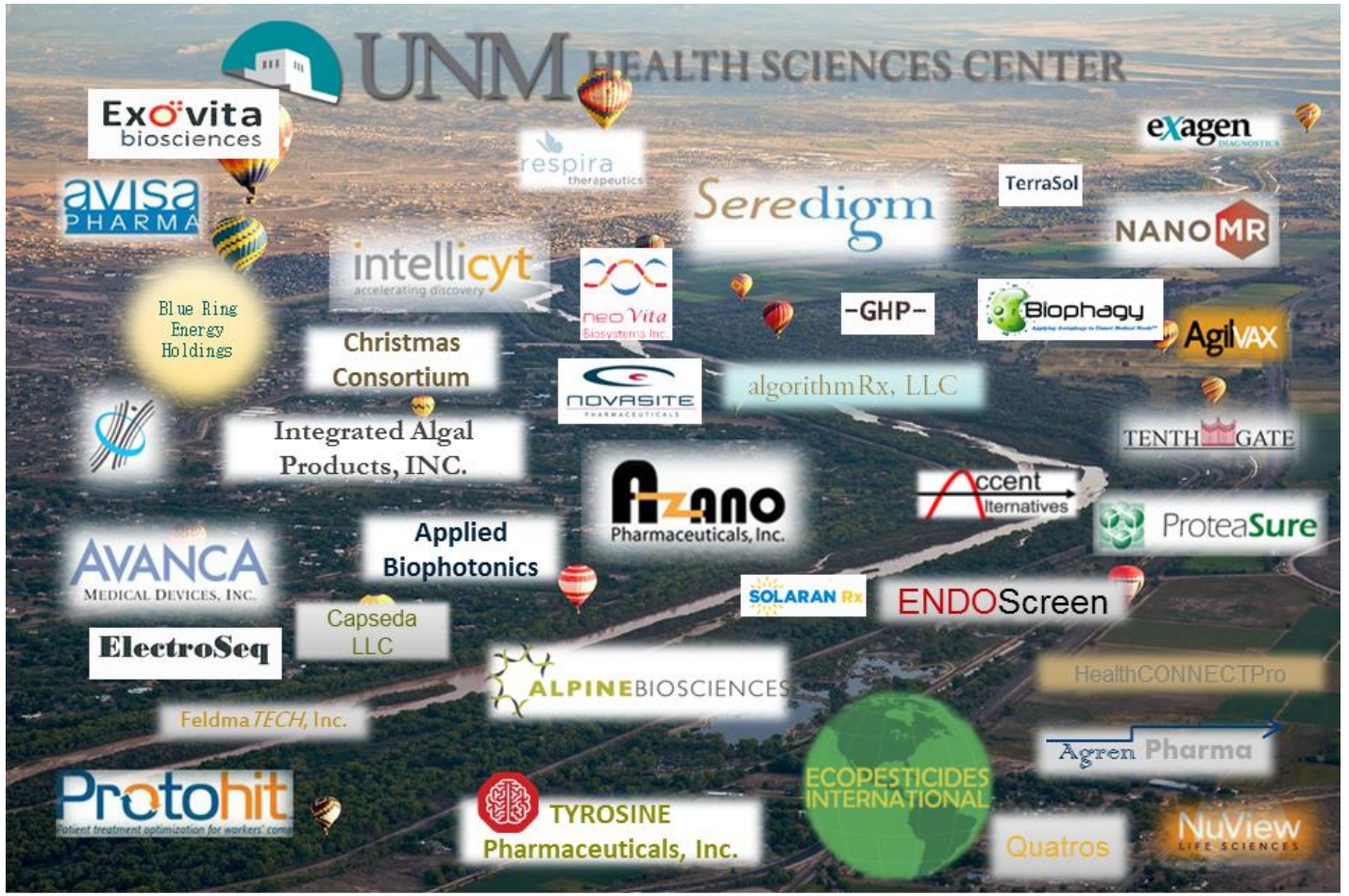
Commercialization and Successful Public-Private Partnerships



Commercialization

UNM HSC Public-Private Partnerships

Since 2004, 38 new companies either were spun off from the university or used university technology to start up.



What is Bioscience?

Five industries make up the biotechnology sector:

1. Agricultural feedstock and chemicals
2. Drugs and pharmaceuticals
3. Medical devices and equipment
4. Research testing and medical laboratories
5. Bioscience-related distribution

Why Bioscience in NM?

What we Have

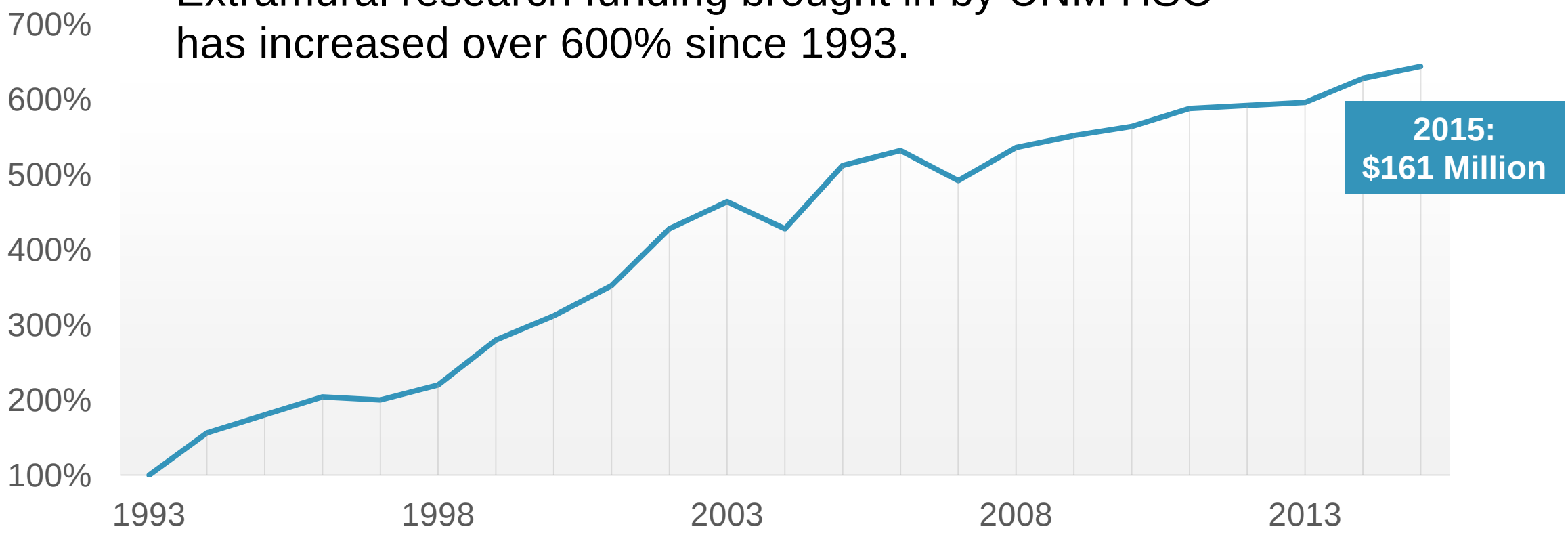
- ✓Strong bioscience R&D from university
  - ✓Already a driver of job growth
  - ✓IP protection
  - ✓Education and workforce development
- ✓Access to capital
- ✓Space, facilities (Innovate ABQ, BioScience, Technology Park)

What is Needed

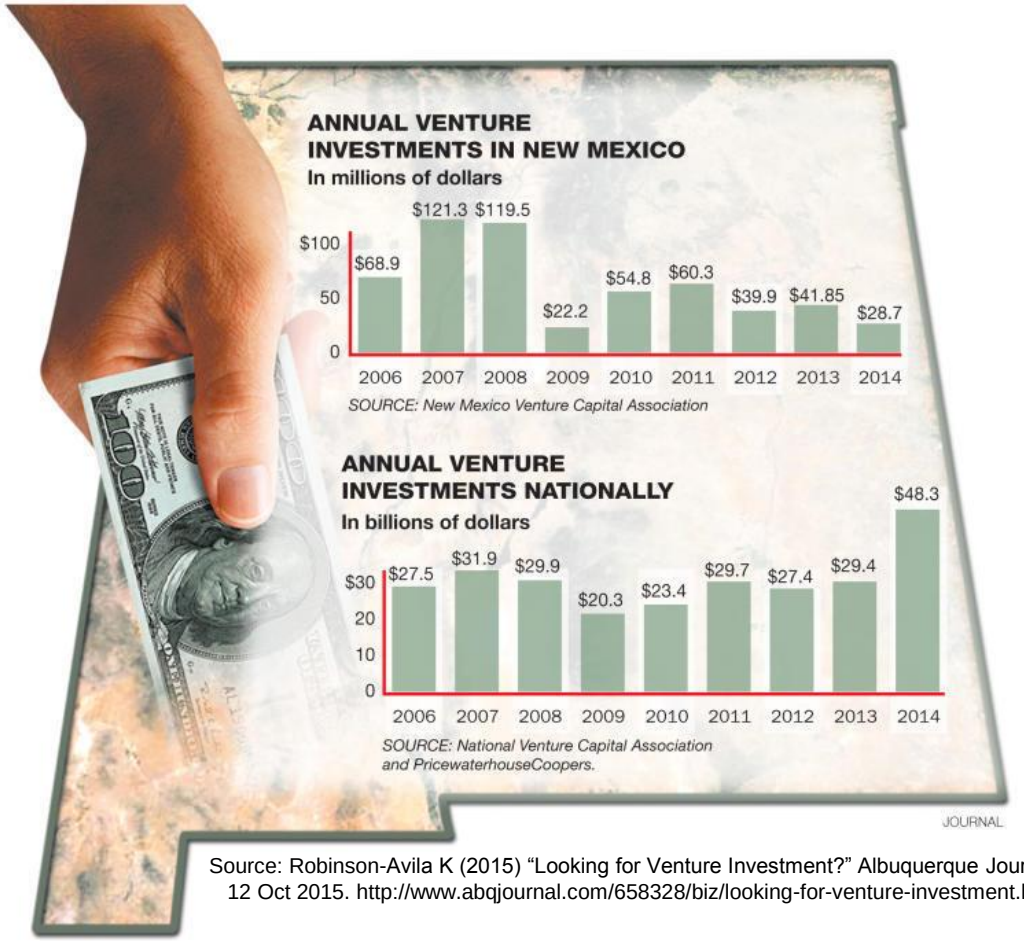
- ❑Federal, state and municipal incentives
  - Cigarette Tax could be directed to this “Valley of Death”
  - Build university bioscience research
  - Seed start-up companies
  - Attract VC capital

Growing Bioscience Research at the UNM Health Sciences Center

Extramural research funding brought in by UNM HSC has increased over 600% since 1993.



Growing Venture Capital in New Mexico



Source: Robinson-Avila K (2015) “Looking for Venture Investment?” Albuquerque Journal, 12 Oct 2015. http://www.abqjournal.com/658328/biz/looking-for-venture-investment.html

Selected Bioscience-Related Metrics, New Mexico

Metric	New Mexico
Bioscience Industry, 2012	
Bioscience Industry Employment	8,304
Bioscience Industry Establishments	622
Academic Bioscience R&D Expenditures, FY 2012	
Bioscience R&D ($ thousands)	$164,830
Bioscience Share of Total R&D	42%
Bioscience R&D per Capita	$79
Bioscience Venture Capital Investments, 2009 – 13 ($ millions)	$107.6
Bioscience and Related Patents, 2009 – 13	356

Adapted from Batelle/BIO (2014) "Batelle/BIO State Biosciences Jobs, Investment and Innovation 2014 State Profile: New Mexico." https://www.bio.org/sites/default/files/SP_New_Mexico.pdf

Workforce

- Hundreds of potential bioscience scientists and engineers produced at universities each year
- High wages; “green” jobs
- Declining numbers of population < 30 years of age stay in New Mexico
- Employment growth (see handout)

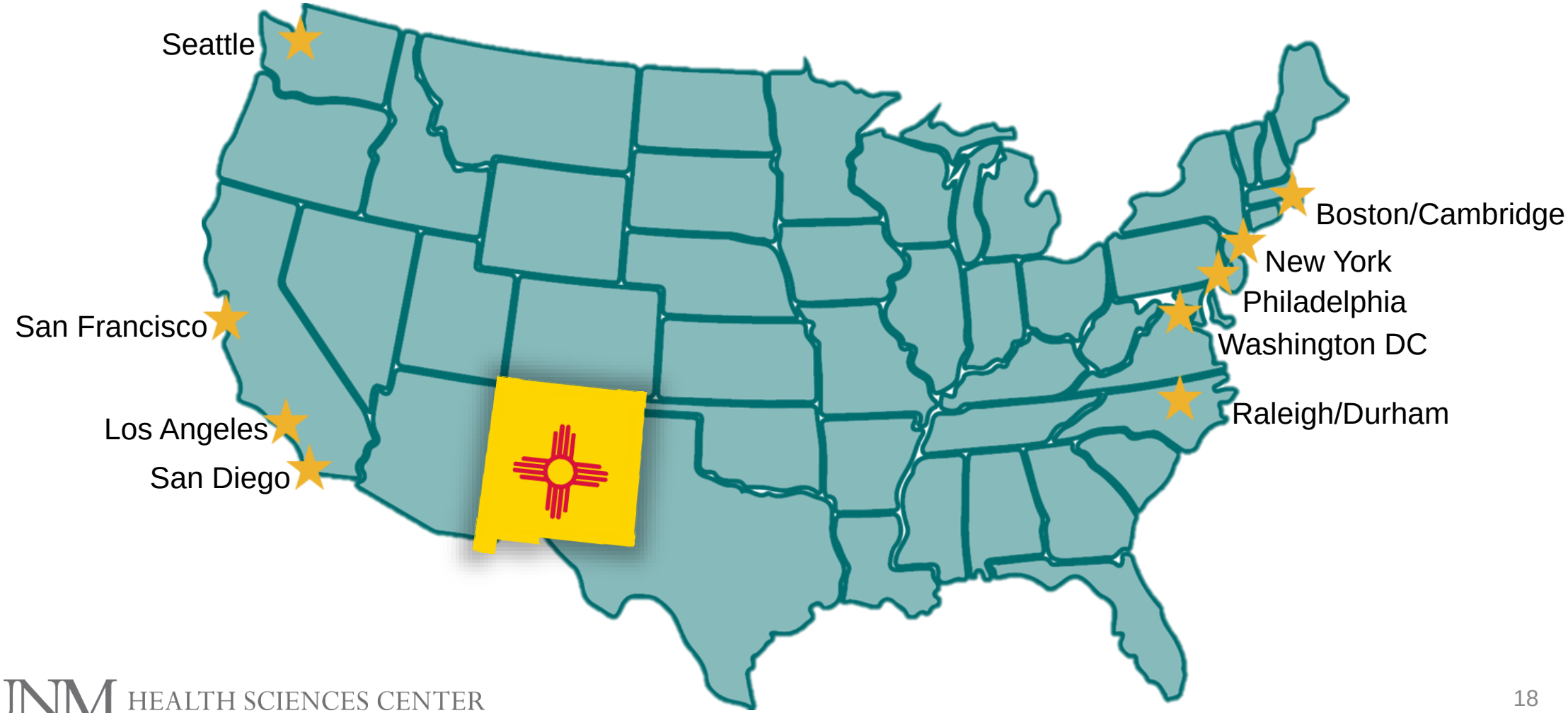
Who Benefits from Bioscience?

Not Just Those with Advanced Degrees

Top Job Opportunities for Biotechnology Technicians and Operators	Median Wage	Minimum Education Level
Sales Reps, Wholesale & Manufacturing, Tech & Scientific Products	$36.84	Bachelor's degree
Inspectors, Testers, Sorters	$17.71	Moderate-term OJT
Medical & Clinical Laboratory Technicians	$19.62	Associate degree
Natural Sciences Managers	$68.74	Bachelor's or higher
Biological Technicians	$22.27	Bachelor's degree
Chemical Technicians	$21.08	Associate degree
Mixing & Blending Machine Operators	$15.57	Moderate-term OJT
Industrial Engineers	$44.23	Bachelor's degree
First-Line Supervisors of Production Workers	$25.34	Related work experience
Life, Physical and Social Science Technicians	$23.73	Associate degree

Source: Economic & Workforce Development Through the California Community Colleges (2013) "Sector Profile: Biotechnology." http://www.coeccc.net/documents/dwm_biotech_sector_CA_12.pdf

Nine Metropolitan Areas are Home to 75% of the Nation's Largest Bioscience Firms



What Have Other States Done?

- General Incentives
- Bioscience-Specific Incentives
  - Industry-focused incentives seem to be critical (more effective than general incentives)

General Incentives

- Workforce training funds
- Economic development incentives
- Tax credits
- Financing

Bioscience-Specific Incentives

- Research innovation pools (public-private)
- Recruitment

- Financing, grants
- Tax credits
- “Bio-Ready Communities”
- Biomedical research bonds
- State “Biocenter”

Some Key Features of Successful Bioscience Programs

Initial Programs at Universities and Small Businesses

- Invests in “gap” funding at universities and to start up bioscience companies (preference to technology that is part of university-private company partnership)
- Funds to recruit “bioscience entrepreneurial” faculty to universities

Some Key Features of Successful Bioscience Programs

Other

- Tax incentives or matching funds to attract venture capital (need restrictions to keep in state)
- Establish state “bioscience venture center” (loans) (typically public-private collaborative group)
- Measurable milestones; milestone payments

How Cigarette and E-Cigarette Taxes Could Stimulate Bioscience

- $1 Cigarette Tax leads to approximately $2M revenue to the UNM Health Sciences Center
- Target bioscience growth
- Funding provides:
  - Gap funding – “Valley of Death”
  - Faculty-bioscience “entrepreneurs”
  - Early stage start-up funds
- Cigarette taxes not already targeted to HSC could also be invested in bioscience (need public-private collaborative)

Questions?

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